We claim:

1. ~~A system for determining whether a vehicle having an associated vehicle~~ path is within an allowed approach of a location, comprising:

navigation means on board the vehicle, for generating vehicle data, wherein the vehicle data is generated at periodic intervals along the vehicle path and includes vehicle position and heading data;

means for transmitting the vehicle data;

means, associated with the location, for receiving the vehicle data;

mapping means, associated with the location, for programming a plurality of positions corresponding to allowed approaches to the location under control of a map mode command and providing therefrom a map of allowed approaches;

evaluation means for tracking the vehicle path and for comparing the vehicle data to the map of allowed approaches to determine whether the vehicle path is within an allowed approach; and

means for generating a control signal if the vehicle is within an ~~allowed approach.~~

2. The system according to claim 1 wherein the mapping means further includes:

means for generating allowed approach data, wherein the allowed approach data is generated at periodic intervals along the allowed approaches;

means for receiving and storing the allowed approach data and creating therefrom the map of allowed approaches.

3. The ~~traffic control preemption~~ system of claim 1 wherein the navigation means is adapted to use signals received from a Global Positioning System (GPS).

4. The ~~traffic control preemption~~ system of claim 3 further including dead reckoning means on board the vehicle for providing vehicle data when GPS signals are obstructed, the dead reckoning means comprising:

first sensing means for detecting the velocity of the vehicle;

second sensing means for detecting the heading of the vehicle; and

means, connected to receive the velocity and heading of the vehicle, for determining a vehicle position based on the velocity and heading of the vehicle.

5. The ~~traffic control preemption~~ system of claim 1 wherein the transmitting means is a radio frequency transmitter.

6. The ~~traffic control preemption~~ system of claim 1 wherein the transmitting means is an optical frequency transmitter.

7. The ~~traffic control preemption~~ system of claim 1 wherein the vehicle data further includes identification codes and priority codes.

8. The ~~traffic control preemption~~ system of claim 1 wherein the vehicle data comprises position, heading and velocity data corresponding to the vehicle.

9. The system of claim 1 wherein the navigation means is adapted to use signals received from a Differential Global Positioning System.

~~10. A preemption system, comprising:~~

a vehicle module associated with a vehicle having a corresponding vehicle path, the vehicle module comprising:

means for receiving signals from a Global Positioning System and for generating therefrom vehicle data, wherein the vehicle data is generated at periodic interval positions along the path of travel and includes vehicle position and heading data; and

~~means for transmitting the vehicle data; and~~

~~an intersection module associated with an intersection and adapted to track~~ the vehicle path, the intersection module comprising:

a programmed map adapted to provide a plurality of stored positions corresponding to allowed approaches to the intersection under control of a map mode command; and

a processor adapted to receive and compare the vehicle data to the programmed map to determine whether the vehicle path is within an allowed approach.

~~11.~~ The system of claim ~~10~~ wherein the intersection module is further adapted to send a preemption request to an intersection controller if the vehicle path is within an allowed approach.

~~12.~~ The ~~traffic control preemption~~ system of claim ~~10~~ wherein the transmitting means is a radio frequency transmitter.

~~13.~~ The ~~traffic control preemption~~ system of claim ~~10~~ wherein the transmitting means is an optical frequency transmitter.

~~14. A traffic control preemption method which uses data received from a global~~ positioning system (GPS) to determine whether a vehicle, having an associated vehicle path, is allowed to preempt a traffic signal at an intersection, comprising the steps of:

(a) receiving GPS signals;

(b) processing the GPS signals on-board the vehicle so as to generate vehicle data;

(c) transmitting the vehicle data;

(d) providing a map of allowed approaches, wherein the map of allowed approaches comprises a plurality of preprogrammed allowed positions ~~proximate to the intersection;~~

(e) comparing the vehicle data with the map of allowed approaches; and

(f) generating a preemption control signal if the vehicle data sufficiently matches the map of allowed approaches.

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15. The traffic control preemption method of claim 14 wherein the step of transmitting vehicle data comprises the step of transmitting vehicle position, heading and velocity data.

16. An method of mapping an allowed approach, comprising the steps of:

(a) receiving GPS signals at a first position of an allowed approach path;

(b) processing the GPS signals to generate mapping data;

(c) transmitting the mapping data and a map mode command;

(d) programming the mapping data under control of the map mode command ;

(e) receiving GPS signals at a next position of the allowed approach path;

(f) repeating steps (b)-(e) until the allowed approach path is completely mapped.

17. An method of tracking a path of travel of a vehicle, comprising the steps of:

(a) receiving a first position signal indicative of a first location of the vehicle;

(b) determining whether the received position signal is within a mapped approach, and if it is not, returning to step (a);

(c) recording the received position signal as a match;

(d) receiving a next position signal indicative of a next location of the vehicle;

(e) determining whether the received position signal is within a mapped approach, and if it is not, recording the received position signal as a miss;

(f) recording the received position signal as a match if the received position signal is within a mapped approach;

(g) repeating steps (b)-(f) until a match threshold is reached;

(h) determining whether a miss-threshold is reached;

(i) issuing a preemption request if the match threshold is reached and the miss threashold is not reached;

(j) dropping a preemption request if the match threshold is reached and the miss threshold is reached;

(k) repeating steps (d)-(j) as long as next position signals are received.

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